3Com U.S. Robotics

56K Message Modem

User's Guide & Reference

This manual covers installation and operating instructions for the following modem:

- **3Com U.S. Robotics 56K Message Modem® external modem**

IMPORTANT MESSAGE: In accordance with the ITU-I standard for 56K transmissions, this modem is capable of 56Kbps downloads. However, the download speeds you experience may be lower due to varying line conditions and other factors. Uploads from users to server equipment travel at speeds up to 31.2 Kbps. An analogue phone line compatible with the ITU-T 56K standard (V.90) or x2 technology, and an Internet provider or corporate host site with the ITU-T 56K standard (V.90) or x2 technology are necessary for these high-speed downloads. Visit our Web site at **http://www.3com.co.uk** for future updates and enhancements.

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Welcome to 56K* Information Access

The International Telecommunications Union (ITU) decides the technical protocols communications devices must use to interoperate with each other. Modems that comply with ITU standards can “talk to” other standards-compliant modems and fax machines worldwide.

The ITU has decided on a worldwide 56K standard technology. So, now with a U.S. Robotics modem you can get all the Internet you want from any service provider who offers the V.90 ITU standard 56K technology or x2™ technology.

This modem will give you the most compatibility with high speed downloads from service providers that offer the ITU 56K standard technology or x2 technology to their customers. 3Com U.S. Robotics is working with providers everywhere to quickly upgrade their service to the V.90 ITU 56K standard.

* Capable of receiving up to 56 Kbps and sending up to 31.2 Kbps.
* The download speeds you experience may be lower due to varying line conditions and other factors.
* Actual speeds may vary.
* Requires compatible phone line and server equipment.
* Complies with both the proposed V.90 ITU 56K standard and x2 protocols.
* See www.3com.com/56k.

Product Features

Your 56K Message Modem provides many advanced features. Here are just a few :

Modulation Schemes

ITU-T V.90 56K standard
x2 Technology (Download up to 56kbps, and Upload at 31,200bps)
ITU-T V.34 (Inc. 33,600 and 28,800bps)
ITU-T V.32bis
ITU-T V.32
ITU-T V.22bis
ITU-T V.22
ITU-T V.23
ITU-T V.21
Bell 212A
Bell 103

Error Control and Data Compression Schemes

ITU-T V.42
ITU-T V.42bis
MNP 2-5

Fax Modulation Schemes

ITU-T V.17
ITU-T V.29
ITU-T V.27ter
ITU-T V.21

Fax Standards

EIA 578 Class 1 FAX
EIA 592 Class 2.0 FAX

Front Channel Link Rates (Download Speeds)

28000, 29333, 30666, 32000, 33333, 34666, 36000, 37333, 38666, 40000, 41333, 42666, 44000, 45333, 46666, 48000, 49333, 50666, 52000, 53333, 54666, 56000, 57333

Back Channel Link Rates (Upload Speeds)

4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200

V.34 Link Rates

4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, 33600

V.32bis Link Rates

4800, 7200, 9600, 12000, 14400

Additional Link Rates

300, 1200/75 (V.23), 1200, 2400

Fax Link Rates

2400, 4800, 7200, 9600, 12000, 14400

Summary of Features

Key Features of 56K Message Modem

56K Message Modem is the first product to include features that allow the user to receive fax and voice messages without the intervention of the PC. 56K Message Modem features a bank of *Flash Memor*y for this purpose. Messages can be received even when the PC is not switched on. Voice messages can be retrieved from a remote location.

56K Message Modem comes with specially designed application software. This product is not just a normal voice/fax/data modem. The software includes all features needed to manage both 56K Message Modem in* autonomous (independent) mode *and normal fax and voice message mode.

56K Message Modem---

- is a feature-enhanced external modem with added *Flash Memory*.
- provides the full functionality of a standard modem.
- retains incoming fax and voice messages and therefore is not just a pass through device.
- is capable of receiving and storing incoming fax and voice messages without any DTE (Data Terminal Equipment) intervention i.e. without a computer being switched on.
- can transfer stored messages to the DTE (Data Terminal Equipment) at a later time.
- enables remotely stored voice messages to be accessed through a dial-up connection.

- offers a voice channel feature that includes a built-in condenser microphone.
- includes software designed specifically for use with 56K Message Modem. The software allows the user to take full advantage of all features in the product. Other software can be used for all standard modem functions. In order to use the autonomous features, however, we recommend using the software delivered with the product.

Before You Begin

From the factory, autonomous (independent) mode is not enabled. Therefore, it is necessary to configure the Message modem using the supplied communication software to make full use of these features. Independent fax and voice functionality can be enabled using the appropriate 'Independent Mode' screen of the supplied software. Also, you will need to set a password for use with the remote feature of the modem. Refer to the software package to choose your 4-digit password.

It is also necessary to record a Personal Greeting Message and Full Message to use with the Message modem Modem. The following section provides full instructions of how to achieve this.

Personal Message

Your personal message can be recorded using the supplied software application.

1. Within the Independent Mode Greeting Screen, click **Record**, and recite your personal message.

   Note: If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

2. Click **Stop** when you have finished.
3. To listen to your message, press PLAY from the supplied software application.

4. Once you have recorded your Personal Message, click on the ‘Download’ button in order to send your Personal Message to the modem.

Full Message

Your full message can be recorded using the supplied software application.

1. Within the Independent Mode Message Full Screen, click **Record**, and recite your Full Message.

   Note: If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

2. Click **Stop** when you have finished.

3. To listen to your message, press PLAY from the supplied software application.

4. Once you have recorded your Full Message, click on the 'Download' button in order to send your Full Message to the modem.

Remote Voice Retrieval

- whilst the modem is in Independent mode -

To access your Voice messages remotely, you need to dial into the 56K Message Modem modem. Whilst the 'outgoing message' is being played, you must enter your pre-configured password on a touch-tone telephone handset (this can be set using the software application).

You have three attempts to enter the correct password. If you fail to enter the correct password, the modem will 'abort' the call and go back 'on hook'.

If the correct password is entered, the modem will either emit,

i) a series of short 'beeps' indicating the number of unread messages or,

ii) one long 'beep' indicating there are no read/ unread messages.

The user has the option to press:

0	for a repeated acoustic message count
1	to play unread messages
2	to play read messages

At any time the user may abort the call by pressing the * key.
The modem will automatically hang-up after a period of in-activity.

Telephone Handset DTMF Digits for Remote Message Retrieval

Digit(s)	Function
0	1) Stops playback of all voice messages 2) Stops the recording of your personal message 3) Stops playback of your personal message
1	Starts playback of all new messages
2	Starts playback of all stored messages, new and old
3	Skips to the next voice message
4 then 4	Deletes all old voice messages in memory
5	Enables/Disables Fax Forwarding feature
6	Repeats the current voice message
7	Records the personal message
8	Not utilized
9	Repeats the new message count
*	Hangs up the modem
#	Not utilized

Independent Mode Facsimile (Fax) Forwarding

Faxes can be forwarded to a predefined phone number. The faxes will continue to be forwarded until the feature is disabled. The faxes can be redirected to a different number at any time by changing the predefined number through the software application. The Independent mode fax forwarding feature is controlled through the software application or remotely.

1) Setup Independent Fax mode

Set the phone number in the application (number is stored in the flash memory of the modem) and then enable/disable using the applicable button.

2) Fax forwarding dial up control

(remote control is limited only to the enable/disable feature as follows)

a) Enter your password and from the **Main** menu, press ⑤ to toggle the enable/disable fax forwarding feature.

b) Confirmation of the enabling/disabling of this feature will be indicated by playing an opening/closing tone.

Caller ID Feature (applies in the UK only)

The Caller ID feature discloses the identification of the caller prior to answering the call. You can enable/disable this feature through the software application and are then able to view the calling telephone number from within a dialing window. Messages retrieved from Independent mode will be stored with identification within the software mailbox.

Caller ID must be subscribed from your telephone provider and needs to be compatible with the British Telecom Caller ID systems before this feature can be utilised.

#**CID=*n***	**Controls Caller ID feature**
#CID=0	Caller ID disabled
#CID=1	Caller ID enabled with formatted information
#CID=2	Caller ID enabled with unformatted information

Part I : External Modem Installation

Part I of this manual covers the installation of your external 56K Message Modem. The instructions are provided for both *Windows* 3.1/ 3.11 (hereafter jointly referred to as *Windows* 3.x) and *Windows* 95 users. Please refer to the section dealing with the operating system you use.

The two sections are:

Section A: External Installation with Windows 3.x (page 10)

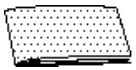
Section B: External Installation with Windows 95 (page12)

Section A: External Modem Installation with Windows 3.x

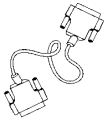
You'll need these items from your 56K Message Modem box:

modem

phone lead & adapter



manual



serial cable & serial adapter

power adapter

How to Connect the Modem

1. Turn off your computer and any attached devices, such as a printer.
2. Connect the serial cable to the modem and to the computer. When looking for the serial port label on the back of your computer, look for ports labelled COM, MODEM, RS-232, or SERIAL. **DO NOT** select AUX, GAME, LPT, or PARALLEL.

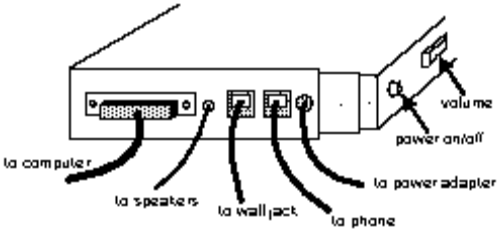
NOTE: Remember which serial port you selected. This information will be necessary when installing your communications software.

3. Plug the power adapter into the power socket on the modem and into a standard wall outlet.
4. Plug one end of the phone lead into the modem telephone socket. It is labelled with a wall plug icon on the bottom of the case. Plug the other end into a phone wall socket.

WARNING: The phone socket you use must be for an **ANALOGUE** phone line. Most office phones are wired through **DIGITAL** lines. Be sure you know what type of line you have. The modem will be damaged if you use a digital phone line.

5. If you wish to use your modem and phone through the same phone wall socket, plug your phone's lead into the modem's phone socket. It is labelled with a phone icon on the bottom of the case. Use an adapter cable if necessary.

NOTE: You cannot use the modem and phone at the same time if they are sharing a line.



6. Turn your modem on.
7. Turn your computer on.
8. Start *Windows 3.x*.

Congratulations! You are ready to start using your 56K Message Modem.

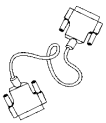
Section B : External Modem Installation with Windows 95

You will need these items from your 3Com U.S. Robotics Message Modem box:

modem

phone cord

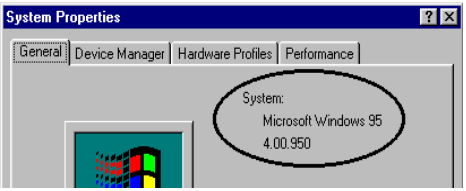
power adapter


serial cable

How to Find Out Which Version of Windows 95 You Have

1. With the right mouse button, click the **My Computer** icon on your desktop.
2. Click **Properties**.
   In the "System Properties" screen, look at the system information under the **General** tab. (This information is circled in the screen shown to the right.)

The number following the text "Microsoft Windows 95" will end with "950," "950a," or "950b." This indicates your version of Windows 95.



3. Write this number down for later reference.
4. Click **OK**.

How to connect the Modem to the Computer

1. Turn off your computer and any attached devices, such as a printer.
2. Connect the serial cable to the modem and to the computer. When looking for your serial port label on the back of your computer, select COM, MODEM, RS-232, or SERIAL..

DO NOT select AUX, GAME, LPT, or PARALLEL.

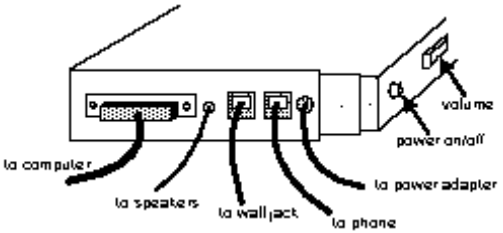
Note: Remember which serial port you selected. This information will be necessary when installing your communications software.

3. Plug the power adapter into the modem power socket and into a standard wall outlet.
4. Plug one end of the phone lead into the modem telephone socket. It is labelled with a wall plug icon on the bottom of the case. Plug the other end into a phone wall socket.

WARNING: The phone socket you're going to use must be for an **ANALOGUE** phone line. Most office phones are wired through **DIGITAL** lines. Be sure you know what type of line you have. The modem will be damaged if you use a digital phone line.

5. If you wish to use your modem and phone through the same phone wall socket, plug your phone's lead into the modem's phone socket. It is labelled with a phone icon on the bottom of the case. Use an adapter cable if necessary.

NOTE: You can not use the modem and phone at the same time if they share the same line.



6. Turn your modem on.
7. Turn your computer on.
8. Start *Windows 95*.

How to Move Through the Screens You See When Windows Restarts

If you have Windows 95 Version 950 or 950a:

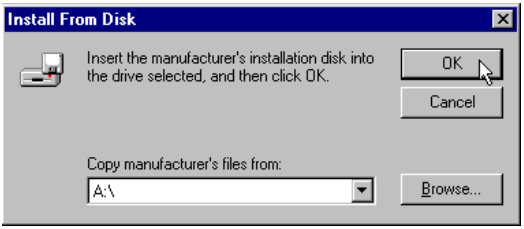
1. When Windows 95 restarts, it should detect the modem. If it does, you will see the following screen.

New Hardware Found
[your modem described here]
Select which driver you want to install for your new hardware:
Windows default driver
Driver from disk provided by hardware manufacturer
Do not install a driver (Windows will not prompt you again)
Select from a list of alternate drivers
OK
Cancel
Help

   Click **Driver from disk provided by hardware manufacturer.** Then click **OK**.

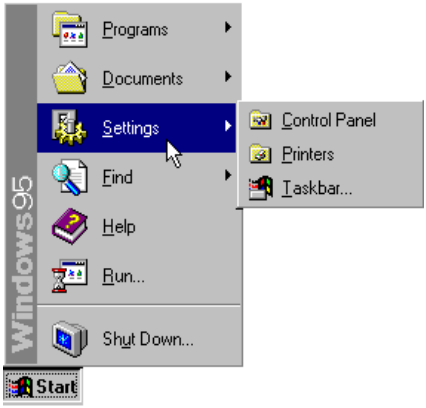
   NOTE: If this screen does not appear, go to "If Plug and Play Does Not Detect Your Modem".

2. Insert the driver disk into your disk drive.
3. When you see this screen, type in **A:**
   If your disk drive is a different letter, type that letter instead of **A**.

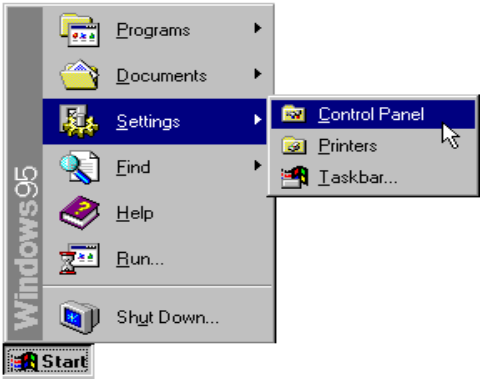


   Click **OK**. Windows will install the drivers for your new modem.

4. You can verify that the install was a success. When your desktop returns, click the Windows **Start** button and point to **Settings**.

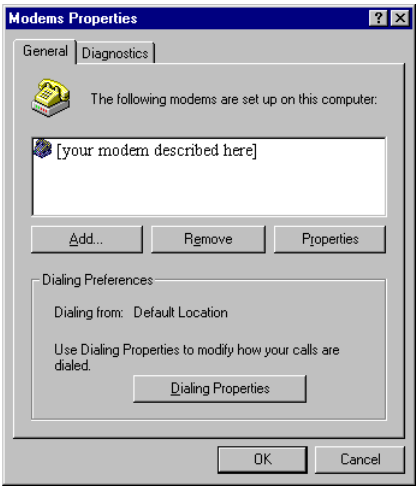


5. Click **Control Panel**.



6. Double-click the **Modems** icon.

7. In the “Modems Properties” screen, you should see *a description for your modem.* This indicates that your new 3Com U.S. Robotics Message Modem is installed correctly.

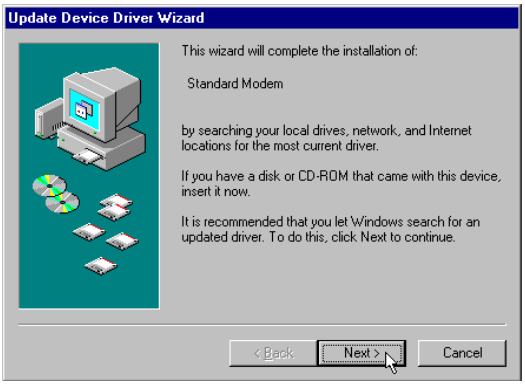


Note: If this screen does not appear, go to “If Plug and Play Does Not Detect Your Modem”.

8. Next, click the **Diagnostics tab at the top of the "Modems Properties" screen. Write down the COM port number for your modem. You will need to know this setting when you install your communications software.**
9. Click **OK**.

If You Have Windows 95 Version 950b:

1. When Windows restarts, it should detect the modem, and you should see a screen like the one below.


Update Device Driver Wizard
This wizard will complete the installation of:
Standard Modem
by searching your local drives, network, and Internet locations for the most current driver.
If you have a disk or CD-ROM that came with this device, insert it now.
It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.
< Back
Next >
Cancel

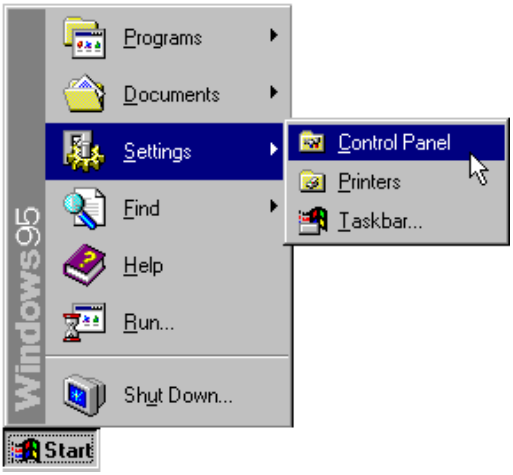
   Insert the driver disk into your disk drive and click **Next**.

   Note: If this screen does not appear, go to "If Plug and Play Does Not Detect Your Modem".

2. When you see the following screen, click **Finish**.

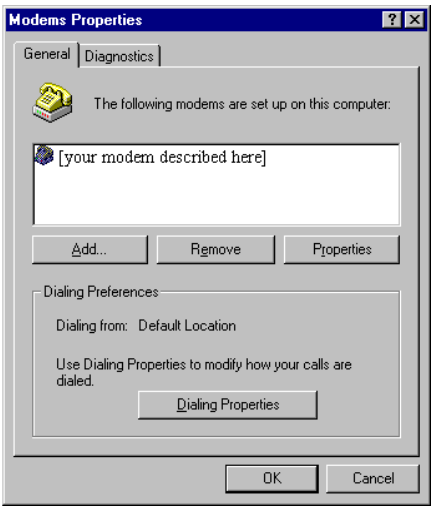
Update Device Driver Wizard
Windows found the following updated driver for this device:
[your modem described here]
If you want to use this driver, click Finish. If this is not the correct driver and you want to search for a different driver manually, click Other Locations.
Location of Driver
Other Locations...
< Back
Finish
Cancel

3. Once Windows finishes loading the information from the disk, you should verify that the modem installation was a success. When your desktop returns, click **Start** and point to **Settings**. Then click **Control Panel**.



4. Double-click the **Modems** icon.

5. In the “Modems Properties” screen, you should see a description of your modem. This indicates that your new 3Com U.S. Robotics Message Modem is installed correctly.



Note: If this screen does not appear, go to “If Plug and Play Does Not Detect Your Modem”.

6. Next, click the **Diagnostics** tab at the top of the “Modems Properties” screen. Write down the COM port number for your modem. You will need to know this setting when you install your communications software.
7. Click **OK**.

Congratulations! You are now ready to start using your 3Com U.S. Robotics Message Modem.

Part II : Beyond Setup

Part II includes information which may not be necessary for installing your modem or voice/fax/data software, but will help to expand your knowledge of the modem and its capabilities. The five sections are:

Section A: Installing Voice/Fax/Data Software (page 23)

Section B: Troubleshooting and Online Help Resources (page 25)

Section C: Glossary (page 35)

Section D: Technical Quick Reference (page 45)

Section E : CE Compliance (page 69)

Section F : Limited Warranty (page 71)

Section A: Installing Voice/Fax/Data Software

Your modem has been designed and tested using a wide range of communications software packages on the market. This section will walk you through some of the details you may need to know when installing communications software packages.

Type of Modem

Most communications software programs will ask you to select the type of modem you are using. Select a *3Com brand high speed modem.* If that selection is not listed, pick *Courier Dual Standard*, *V.32bis,* or *V. 34.*

KEY POINT: Refer to the manual that came with your software for its installation instructions. The software's installation program will ask you questions about the modem you are using.

Initialisation String

For hardware flow control, a fixed serial port rate and full result codes type:

AT&F1<Enter>

If you must use software flow control, type:

AT&F2<Enter>

Flow Control

- For hardware flow control (highly recommended), select *RTS/CTS.*
- For software flow control, select *XON/XOFF.*

NOTE: Disable the type of flow control (hardware or software) that you are not using.

UART - Universal Asynchronous Receiver Transmitter

(External Modems Only)

If you are running Windows 3.x or you have upgraded your system from Windows 3.x to Windows 95, you can run MSD to determine your UART setting. In DOS, type **MSD** at the Windows directory prompt and then press **ENTER**. Follow the on-screen instructions to access the COM port settings panel. In this panel you should find the UART chip used. Match the UART type listed in MSD with the serial rate listed in the chart below. Select this serial rate (sometimes called the "port rate") in any communications software you use.

If this is your UART...	Select this serial rate
16550	115.2 or 57.6 Kbps
16450	38.4 Kbps
8250	19.2 Kbps

NOTE: DO NOT select a 28,800, 14,400, or 12,000 bps serial port rate if offered. Your modem will **NOT** work correctly with any of these settings. Fix or lock the serial port (baud) rate. If it's referred to as *autobaud*, select *OFF*.

Section B : Troubleshooting and Online Help Resources

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
The computer or software will not recognize the modem.	You may not be entering modem commands in the proper manner in Terminal mode.	Type in all upper case (AT) or all lower case (at).
	If you are using an external modem, the COM port may not be enabled.	Refer to the computer's manual for information about enabling COM ports. This usually involves altering the bios settings, motherboard jumpers, and the operating system.
	You may have a COM port/IRQ conflict.	Make sure you have the correct COM port and IRQ settings in your software and/or in the Windows Device Manager.
The modem will not go off hook to dial or does not answer the phone.	You may have plugged your modem's phone cord into the wrong socket on the modem.	Make sure the phone cord is plugged into the modem socket labeled with a wall plug icon.
	The phone jack may have been wired incorrectly.	Contact the telephone company. Ask them to make sure the tip and ring are on the outside pair of wires.
	You may have a bad phone cord connection to your modem.	Make sure one end of the phone cord is plugged into the wall plug icon socket on the modem and the other end into the wall jack of the phone. The phone cord should be no longer than 12 feet in length. Use the phone cord included with your modem, if possible.

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
The modem will not go off hook to dial or does not answer the phone.	You may have plugged your modem's phone cord into a digital line.	Plugging your modem's phone cord into a digital phone line can damage the modem. Call your phone company if you are unsure whether or not your phone line is digital.
	The software you are using may not have auto answer enabled.	Make sure the auto answer feature is enabled. You need to enable auto answer before every session, unless you alter your software's initialization string to permanently enable auto answer.
	You may have devices between the modem and the phone jack.	There should be no line splitters, fax machines or other devices between the modem and the wall jack.
	You may have a poor line connection.	Try placing the call again. The phone company routes calls differently each time.
	If you have voice mail, your dial tone may be altered when messages are waiting.	Retrieve your voice mail messages to restore normal dial tone.
	You may be using the wrong power supply for your external modem	Use the power supply that came with your modem.
Both modems exchange carrier signals but fail to establish a link.	You may have a poor line connection.	Try placing the call again. The phone company routes calls differently each time.
	The phone jack may have been wired incorrectly.	Contact the telephone company. Ask them to make sure the tip and ring are on the outside pair of wires.

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
Your modem will not connect at 2400 bps with a 2400 bps modem.	The modem you are trying to connect with, could be an older model that does not support error control.	You can disable error control on your modem by typing the following command in the Terminal Mode: **AT&M0** and press **ENTER**. Now try placing the call to the remote modem again. When finished, reset your modem to enable the error control features. In Terminal Mode, type **ATZ** and press **ENTER**. **ATZ4** or **AT&F1** are often the best reset strings, as they restore hardware flow control settings.
Your screen keeps displaying random garbage characters.	You could have a conflict with the remote modem's settings for word length, parity, and stop bits.	Set your modem's word length, parity, and stop bits the same as the remote modem or BBS you are calling. The common settings are: Data bits - 8 Stop bits - 1 Parity - none
	Your software and modem might not be set to the same flow control settings.	Make sure the software and modem have the same flow control rate settings, either hardware [RTS/CTS] or software [xon/xoff] flow control.
	The best flow control settings might not be enabled on your modem.	Type this command in Terminal Mode to load the optimal hardware flow control settings, **AT&F1** and press **ENTER**.
	Your Internet Service Provider (ISP) may not provide x2 service.	Make sure your ISP offers x2 technology or find an ISP who is capable of providing x2 service.
	The phone connection might not be able to handle high speed data transmission.	Try lowering the connection speed you are using.

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
Your communications software is reporting many cyclic redundancy check (CRC) errors and low characters per second (CPS).	You may have a bad phone line.	Try placing the call again. The phone company routes calls differently each time.
	Optimal flow control settings may not be enabled on your modem.	Type this command in Terminal Mode to load the optimal hardware flow control settings, **AT&F1** and press **ENTER**.
	The serial port rate in your communications software may be set too high for your area's phone lines or your modem's UART.	Lower the serial port rate in your communications software to 57,600 bps, 38,400 bps or 19,200 bps. Do not use 14,400, 28,800, or 33,600. The port rate for a ITU-T V.90/x2 modem cannot be set lower than 57,600, if you want to achieve a ITU-T V.90/x2 connection.
	The remote site you are dialling into may have trouble with the file transfer protocol.	Try using a different file transfer protocol. Do not use Xmodem if other protocols are available.
	There may be a Terminate and Stay Resident (TSR) program (such as a screen saver or virus scanner) running in the background, disrupting data communications.	Disable any Terminate and Stay Resident (TSR) programs running in the background. If you have software running as a TSR, check the software's manual for information about disabling its ability to operate as a TSR.
	You may be trying to download a file to a compressed area of your hard drive.	Download to an uncompressed area on your hard drive.

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
Your communications software is reporting many cyclic redundancy check (CRC) errors and low characters per second (CPS).	If your communications program is DOS-based, you are running it under Windows, at the same time with other software. Conflicts between these programs may be causing the CRC errors.	Close every program but the communications program.
Errors are constantly occurring in your V.17 fax transmissions.	Your modem initialization string could be insufficient for fax transmissions.	Type the following initialization string in Terminal mode **AT&H3&I2&R2S7=90S** and press **ENTER**.
	There may be a Terminate and Stay Resident (TSR) program (such as a screen saver or virus scanner) running in the background, disrupting data communications.	Disable any Terminate and Stay Resident (TSR) programs running in the background. If you have software running as a TSR, check the software's manual for information about disabling its ability to operate as a TSR.
	You could have an outdated COM driver on your system.	Load the COM driver that came with your fax software.
	Your baud rate may be set too high.	Lower baud rate to 9600, 7200, or 4800.
	You may be trying to fax a compressed file.	Open the file in the application in which it was created. Select your communications software as the printer and then print the file.
The modem displays double characters on your monitor.	Both the modem's and software's local character echoes are probably turned on.	Disable local echo in your software OR on your modem (not both). You can turn the local echo off on the modem by typing **ATE0** and pressing **ENTER** in your software's Terminal Mode. To turn the local echo off in the software, refer to its documentation.

PROBLEM	DIAGNOSIS	POSSIBLE SOLUTION
Your modem cannot achieve a 56K Internet connection.	This modem is capable of 56Kbps downloads. However, the download speeds you experience may be lower due to varying line conditions and other factors. Uploads from users to server equipment travel at speeds up to 31.2 Kbps. An analogue phone line compatible with the ITU-T V.90 standard or x2 technology, and an Internet provider or corporate host site with the ITU-T 56K standard or x2 technology are necessary for these high-speed downloads.	Call your phone company to determine if your phone line is compatible with the ITU-T V.90 standard and/or is x2-compatible.
Communications software fails to initialize the modem.	The communications software's port settings may be incorrect.	Make sure the communications software's port settings are set correctly for your modem.

If Plug and Play Does Not Detect Your Modem

Try the following:

1. Click Windows 95 **Start** and click **Shut Down**. When asked if you wish to shut down your computer, click **Yes**. When Windows 95 indicates that it is safe to turn off your computer, turn it off and wait 15 seconds. Then turn the computer back on. Windows 95 may detect your modem upon this restart even if it did not detect the modem during the initial installation. If you see screens indicating that new hardware has been detected by Windows 95, turn to "Installing the Modem Drivers with Windows 95". If not, continue with the next step.

2. Click Windows 95 **Start**, point to **Settings**, and click **Control Panel**. Double-click the **System** icon and then click the **Device Manager** tab on the "System Properties" screen. Look for "Other Devices" or "Unknown Devices" in the list that appears. If you do not see either of these options in the list, continue with the next section to learn about our support options. If you do see one of these options, double-click the option. If the description that appears matches the modem you are trying to install, click **Remove**. Click **OK** when Windows asks if you wish to remove the device. Next, restart the computer as described in step 1 on this page. If the computer does not detect the modem after this second restart, please refer to our support options.

Online Help Resources

Connecting to the 3Com BBS

To connect to the 3Com Bulletin Board System, follow these steps:

1. Start your communications software. The software settings for the BBS are as follows:
   ANSI terminal emulation
   Data Bits: 8
   Parity: None
   Stop Bits: 1

2. Put your computer in Terminal mode. Enter the following command:
   ATDT 01189692200<Enter>

3. If this is your first time connecting to our BBS, you will be asked to enter your name and a password, as well as fill out a questionnaire.

4. When you finish registering, press enter with each prompt until you come to the main menu. Select the appropriate letter to perform the desired function.

3Com offers a number of other on-line technical support options. Choose any one of the following if you need help with your new Modem.

Internet FTP
Provides free library containing the same files as the BBS site. FTP to ftp.usr.co.uk

Internet On Demand
Provides automatic technical support through a library containing product information, quick reference cards and installation help. To obtain an index of available documents, send blank e-mail to uksupport@usr.com. To have a document e-mailed to you, send a document's 3-digit number as the subject.

World Wide Web
A 3Com Home Page containing the same information as the Internet on Demand listing as well as information about the U.S. Robotics brand products. Logon to http://www.3com.co.uk

Bulletin Board System
The 3Com BBS provides answers to the most commonly asked technical and non-technical questions.

BBS	0118 9692200

Fax and Technical Support Hotline
Technical questions about U.S. Robotics brand modems can also be answered via fax or by technical support representatives.

Fax	08708444547
Hotline	08708444546

Are You Still Having Problems?

Should you encounter any difficulties with your 56K Message Modem faxmodem, refer to the manual first.

Call or visit your dealer, if they are unable to assist you, contact the 3Com Technical Support Department from Monday through to Friday, during normal office hours on;

Email address:	uk_modemsupport@3com.com
BBS:	0118 969 2200
Fax:	0870 844 4547
Tel:	0870 870 844 4546
Web site:	http://www.3com.co.uk

Upon contacting 3Com you will be issued with a Call Reference Number (CRN). This should be quoted when contacting the Technical Support Department in relation to your query.

Should you be advised to return your modem, 3Com will repair or replace and return the unit for you.

Please note that our U.S. Robotics brand modems cannot be returned without prior approval by the 3Com Technical Support Department.

IMPORTANT : If you are advised to return your unit please ship your unit packaged securely and make sure that the CRN number is clearly visible on the outside of the package. Please ship the unit with all charges prepaid and insured.

Section C : Glossary

Cross references are printed in **boldface**. Cross references with items in the Command Summary, found in Section D: Technical Quick Reference, are printed in *italics.*

analogue loopback
A modem self-test in which data from the keyboard or an internal test pattern is sent to the modem's transmitter, turned into analogue form, looped back to the receiver, and converted back into digital form.

analogue signals
A variety of signals and wavelengths that can be transmitted over communications lines such as the sound of a voice over the phone line. Contrast with **digital signals**.

answer mode
The mode used by your modem when answering an incoming call from an originating modem. The transmit/receive frequencies are the reverse of the originating modem, which is in **originate mode**.

application
A computer program designed to perform a specific function, such as a word processing or organizing data into a spreadsheet.

ARQ
Automatic Repeat reQuest. A general term for a function that automatically allows your modem to detect flawed data and retransmit it. See **MNP** and **V.42**.

ASCII
American Standard Code for Information Interchange. A code used to represent letters, numbers, and special **characters,** such as $, !, and /.

asynchronous transmission
Data transmission in which the length of time between transmitted **characters** may vary. Because the time lapses between transmitted characters are not uniform, the receiving modem must be signaled as

to when the data bits of a character begin and when they end. The addition of **start/stop bits** to each character serves this purpose.

Auto Answer
Sets the modem to pick up the phone line when it detects a certain number of rings. See S-register S0 in Section D: Technical Quick Reference.

auto dial
A process where your modem dials a call for you. The dialling process is initiated by sending an *ATDT* (dial tone) or *ATDP* (dial pulse) command followed by the telephone number to dial. Auto dial is used to dial voice numbers. See command *Dn.*

baud rate
A term used to measure the speed of an analogue transmission from one point to another. Although not technically accurate, baud rate is commonly used to mean **bit rate**.

binary digit (bit)
A 0 or 1, reflecting the use of the binary numbering system. Used because the computer recognizes either of two states, OFF or ON. The shortened form of binary digit is bit.

bit rate
Also referred to as transmission rate. The number of **binary digits**, or bits, transmitted per second (**bps**). Communications channels using telephone channel modems are established at set bit rates, commonly 2400, 4800, 9600, 14,400, 28,800 and 33,600.

bits per second (bps)
The bits (**binary digits**) per second rate. Thousands of bits per second are expressed as kilobits per second or Kbps.

buffer
A memory area set aside to be used as temporary storage during input and output operations. An example is the modem's command buffer.

byte
A group of **binary digits** stored and operated upon as a unit. In user documentation, the term usually refers to 8-bit units or **characters**. One kilobyte (KB) is equal to 1,024 bytes or characters; 640 KB indicates 655,360 bytes or characters.

carrier
A tone signifying a connection the modem can alter to communicate data across telephone lines.

character
A representation, coded in **binary digits**, of a letter, number, or other symbol.

characters per second (CPS)
A data transfer rate generally estimated from the **bit rate** and the **character** length. For example, at 2400 bps, 8-bit characters with **start/stop bits** (for a total of ten bits per character) will be transmitted at a rate of approximately 240 characters per second (cps). Some **protocols**, such as error-control protocols, employ advanced techniques such as longer transmission **frames** and **data compression** to increase cps.

class 1 and 2.0
International standards used between fax **application** programs and faxmodems for sending and receiving faxes.

cyclic redundancy checking (CRC)
An error-detection technique consisting of a test performed on each block or **frame** of data by both sending and receiving modems. The sending modem inserts the results of its tests in each data block in the form of a CRC code. The receiving modem compares its results with the received CRC code and responds with either a positive or negative acknowledgment.

data communications
A type of communications in which computers are able to exchange data over an electronic medium.

data compression table
A table containing values assigned for each **character** during a call under **MNP**5 data compression. **Default** values in the table are continually altered and built during each call: The longer the table, the more efficient **throughput** gained.

data mode
The mode in which the faxmodem is capable of sending and receiving data files. A standard modem without fax capabilities is always in data mode.

DCE
Data Communications (or Circuit-Terminating) Equipment, such as dial-up modems that establish and control the data link via the telephone network.

default
Any setting assumed, at startup or reset, by the computer's software and attached devices. The computer or software will use these settings until changed by the user or other software.

detect phase
In the **ITU-T** V.42 error-control **protocol**, the first stage in establishing if both modems attempting to connect have **V.42** capability.

dictionary
The term used for compression codes built by the **V.42** ***bis*** data compression algorithm.

digital loopback
A test that checks the modem's RS-232 interface and the cable that connects the **terminal** or computer and the modem. The modem receives data (in the form of **digital signals**) from the computer or terminal, and immediately returns the data to the screen for verification.

digital signals
Discrete, uniform signals. In this manual, the term refers to the **binary digits** 0 and 1. Contrast with **analogue signals**.

DTE
Data **Terminal** (or Terminating) Equipment. A computer that generates or is the final destination of data.

duplex
Indicates a communications channel capable of carrying signals in both directions. See **half duplex**, **full duplex**.

Electronic Industries Association (EIA)
Group which defines electronic standards in the U.S.

error control
Various techniques that check the reliability of **characters** (**parity**) or blocks of data. **V.42** and **MNP** error-control **protocols** use error detection (**CRC**) and retransmission of flawed **frames** (**ARQ**).

facsimile
A method for transmitting the image on a page from one point to another. Commonly referred to as fax.

fax mode
The mode in which the faxmodem is capable of sending and receiving files in a **facsimile** format. See definitions for **V.17, V.27ter, V.29**.

flow control
A mechanism that compensates for differences in the flow of data into and out of a modem or other device. See commands *&Hn, &In, &Rn.*

frame
A **data communications** term for a block of data with header and trailer information attached. The added information usually includes a frame number, block size data, error-check codes, and Start/End indicators.

full duplex
Signal will flow in both directions at the same time over one line. In microcomputer communications, may refer to the suppression of the online **local echo**.

half duplex
Signals will flow in both directions, but only one way at a time. In microcomputer communications, may refer to activation of the online **local echo**, which causes the modem to send a copy of the transmitted data to the screen of the sending computer.

Hz
Hertz, a frequency measurement unit used internationally to indicate cycles per second.

ITU-T (International Telecommunications Union)
An international organization that defines standards for telegraphic and telephone equipment. For example, the Bell 212A standard for 1200-bps communication in North America is observed internationally as ITU-T **V.22**. For 2400-bps communication, most U.S. manufacturers observe V.22 bis. The initials ITU-T represent the French name. In English it is known as the International Telegraph and Telephone Consultative Committee.

LAPM
Link Access Procedure for Modems. An error-control **protocol** defined in **ITU-T** Recommendation V.42. Like the **MNP** protocols, LAPM uses **cyclic redundancy checking** (**CRC**) and retransmission of corrupted data (**ARQ**) to ensure data reliability.

local echo
A modem feature that enables the modem to display keyboard commands and transmitted data on the screen. See command *En*.

MNP
Microcom Networking Protocol, an error-control **protocol** developed by Microcom, Inc., and now in the public domain. There are several different MNP protocols, but the most commonly used one ensures error-free transmission through error detection (**CRC**) and retransmission of erred **frames**.

modem
A device that transmits/receives computer data through a communications channel such as radio or telephone lines. It also changes signals received from the phone line back to **digital signals** before passing them to the receiving computer.

nonvolatile memory (NVRAM)
User-programmable random access memory whose data is retained when power is turned off. On the Modem, it includes four stored phone numbers and the modem settings.

off/on hook
Modem operations that are the equivalent of manually lifting a phone receiver (taking it off-hook) and replacing it (going on-hook).

online fall back/fall forward
A feature that allows high-speed, error-control modems to monitor line quality and fall back to the next lower speed in a defined range if line quality diminishes. As line conditions improve, the modems switch up to the next higher speed.

originate mode
The mode used by your modem when initiating an outgoing call to a destination modem. The transmit/receive frequencies are the reverse of the called modem, which is in **answer mode**.

originate mode
The mode used by your modem when initiating an outgoing call to a destination modem. The transmit/receive frequencies are the reverse of the called modem, which is in **answer mode**

parity
A simple error-detection method that checks the validity of a transmitted **character**. Character checking has been surpassed by more reliable and efficient forms of error checking, including **V.42** and **MNP 2-4 protocols**. Either the same type of **parity** must be used by two communicating computers, or both may omit parity.

protocol
A system of rules and procedures governing communications between two or more devices. Protocols vary, but communicating devices must follow the same protocol in order to exchange data. The format of the data, readiness to receive or send, error detection and error correction are some of the operations that may be defined in protocols.

Random Access Memory (RAM) Memory that is available for use when the modem is turned on, but that clears of all information when the power is turned off. The modem's RAM holds the current operational settings, a **flow control buffer**, and a command **buffer**.

remote digital loopback
A test that checks the phone link and a remote modem's transmitter and receiver.

remote echo
A copy of the data received by the remote system, returned to the sending system, and displayed on the screen. Remote echoing is a function of the remote system.

ROM
Read Only Memory. Permanent memory, not user-programmable.

serial transmission
The consecutive flow of data in a single channel. Compare to parallel transmissions where data flows simultaneously in multiple channels.

start/stop bits
The signalling bits attached to a **character** before and after the character is transmitted during **asynchronous transmission**.

terminal
A device whose keyboard and display are used for sending and receiving data over a communications link. Differs from a microcomputer or a mainframe in that it has little or no internal processing capabilities.

terminal mode
Software mode that allows direct communication with the modem. Also known as command mode.

throughput
The amount of actual user data transmitted per second without the overhead of **protocol** information such as **start/stop bits** or **frame** headers and trailers. Compare with **characters per second**.

V.8
The **ITU-T** standard specification that covers the initial handshaking process.

V.17 fax
An **ITU-T** standard for making **facsimile** connections at 14,400 bps, 12,000 bps, 9600 bps, 7200 bps.

V.21
An **ITU-T** standard for modems operating in asynchronous mode at speeds up to 300 bps, **full-duplex**, on public switched telephone networks.

V.22
An **ITU-T** standard for modem communications at 1200 bps, compatible with the Bell 212A standard observed in the U.S. and Canada.

V.22 bis
An **ITU-T** standard for modem communications at 2400 bps. The standard includes an automatic link negotiation fallback to 1200 bps and compatibility with Bell 212A/V.22 modems.

V.27 ter
An **ITU-T** standard for **facsimile** operations that specifies modulation at 4800 bps, with fallback to 2400 bps.

V.29
An **ITU-T** standard for **facsimile** operations that specifies modulation at 9600 bps, with fallback to 7200 bps.

V.32
An **ITU-T** standard for modem communications at 9600 bps and 4800 bps. V.32 modems fall back to 4800 bps when line quality is impaired.

V.32 bis
An **ITU-T** standard that extends the V.32 connection range: 4800, 7200, 9600, 12,000, and 14,400 bps. V.32 *bis* modems fall back to the next lower speed when line quality is impaired, fall back further as necessary, and also fall forward (switch back up) when line conditions improve.
See **online fall back/fall forward**.

V.34
An **ITU-T** standard that currently allows data rates as high as 33,600 and 28,800 bps.
V.42
An **ITU-T** standard for modem communications that defines a two-stage process of detection and negotiation for **LAPM error control**.

V.42 bis
An extension of **ITU-T** V.42 that defines a specific data compression scheme for use during V.42 connections.

Xmodem
The first of a family of **error control** software **protocols** used to transfer files between modems. These protocols are in the public domain and are available from many bulletin board services.

XON/XOFF
Standard **ASCII** control **characters** used to tell an intelligent device to stop/resume transmitting data.

Ymodem
An error-checking **protocol** that can send several files of data at a time in 1024-**byte** (1K) blocks. This protocol can use either checksums or CRC for error checking.

Ymodem G
Similar to **Ymodem**, except it includes no error checking, which makes it faster.

Zmodem
Similar to **Xmodem** and **Ymodem**, except it includes batch transfer, the ability to recover from a partially complete transfer, an autostart feature, and improved efficiency.

Section D : Technical Quick Reference

Section D includes information about:

- Front Panel Lights (External Modems Only)
- Typing Commands
- Basic Data Commands
- Extended Data Commands
- S-Registers
- Fax Commands
- The Serial Interface (Cable Information)

LED Indicators (Front Panel Lights)

AA	Auto Answer	Answer mode: ON when register S0 is set to 1 or higher (Auto Answer), and when answering a call; OFF when modem originates a call. Light flashes when there is an incoming call.
MEM	Message Memory	**ON** indicates that auto answer is ON and the modem will answer any call when the PC is off. **OFF** indicates that auto answer is OFF and the modem will not answer any call when the PC is off.
CD	Carrier Detect	**ON** if modem receives a valid data signal (carrier) from a remote modem, indicating that data transmission is possible. Always ON if CD override is ON (&C0).
RD	Receive Data	Flashes when modem sends result codes or passes received data bits from remote modem.

SD	Send Data	Flashes when computer sends a data bit to modem.
TR	Data Terminal Ready	**ON** if modem receives a DTR signal from computer. Always ON (modem ignores DTR) if the DTR override is ON (&D0).
CS	Clear to Send	**ON** until modem lowers CTR when transmit data hardware flow control is enabled (&H1, &H3).
MSG	New Message	Blinks **red** once for each new fax message. Blinks **green** once for each new voice message. Solid **amber** indicates that you have retrieved your messages, but that they have not been deleted from memory.
FAX..	Fax Operations	Data Mode: Automatic Repeat Request. ON if modem is set to &M4 or &M5 and successfully establishes an error control connection. Flashes when modem retransmits data to remote modem.
.....	.....	Fax Mode: Flashes to indicate fax mode.
.....	.....	56K Message Modem: Dual color LED with green indicating 56K Message Modem is enabled and red indicating it is off. Solid green indicates no new messages. Each new message will be indicated by a single slow blink. Fast blinking indicates that the flash memory is full.
OH....	Off Hook	**ON** when modem accesses the phone line. **OFF** when modem is On Hook.

Typing Commands

- Type commands in either upper or lower case, not a combination. Use the Backspace key to delete errors. (You cannot delete the original AT command since it is stored in the modem buffer.)

- If a command has numeric options and you don't include a number, zero is assumed.
  For example, if you type ATB, the command ATB0 is assumed.

- Every command except A/,+++ and A> must begin with the AT prefix and be entered by pressing **<ENTER>**.

- The maximum command length is 58 characters. This does not include the AT prefix, carriage returns, or spaces.

Note: All defaults are based on the &F1, the Hardware Flow Control template loaded in NVRAM when the modem is shipped. Defaults are listed in *italics.*

Basic Data Commands

<control key>S Stop or restart help screens

<control key>C or
<control key>K Stop help screens

$ Use in conjunction with *D*, *S*, or *&* commands (or just AT) to display a basic command list; online help.

A Manual Answer: goes off hook in answer mode. Pressing any key aborts the operations.

A/ Re-executes the last issued command. Used mainly to redial. This does not require the AT prefix or a Carriage Return.

A> Re-executes the last issued command continuously, until the user intervenes or the command is executed. Does not require the AT prefix or a Carriage Return.

Any key Aborts off-hook dial/answer operation and hangs up.

AT Required command prefix, except with A/ and +++, and A. Use alone to test for OK result code.

B*n* **U.S./ITU-T answer sequence.**

B0	*ITU-T answer sequence*
B1	U.S. answer tone

D*n* **Dials the specified phone number. Includes the following:**

0-9	Numeric digits
#,*	Extended touchtone pad tones
L	Dials the last dialled number.
P	Pulse (rotary) dial
R	Originates call using answer (reverse) frequencies.
Sn	Dials the phone number string stored in NVRAM at position n (n = 0–3). Phone numbers are stored with the &Zn=s command.
T	Tone dial

, (Comma) Pause, See S8 definition; which it's linked to.

; (Semicolon) Return to Command mode after dialling.

" Dials the letters that follow (in an alphabetical phone number).

! (Exclamation point) Flashes the switch hook.

/ Delays for 125 ms. before proceeding with dial string.

W Wait for second dial tone (X2 or X4); linked to S6 register.

@ Dials, waits for quiet answer, and continues (X3 or higher).

$ Displays a list of Dial commands.

E*n* **Sets local echo.**

E0 Echo OFF

E1 Modem displays keyboard commands

F*n* **Sets online local echo of transmitted data ON/OFF.**

F0 Local echo ON. Modem sends a copy of data it sends to the remote system to your screen.

F1 Local echo OFF. Receiving system may send a remote echo of data it receives.

H*n* **Controls ON/OFF hook.**

H0 Hangs up (goes on hook).

H1 Goes off hook.

I*n* **Displays the following information.**

I0 Four-digit product code

I1 Results of ROM checksum

I2 Results of RAM checksum

I3 Product type

I4 Current modem settings

I5 Nonvolatile memory (NVRAM) settings

I6 Link diagnostics

I7 Product configuration

I9 Plug and Play information

I11 Extended Link Diagnostics

L*n* **Controls speaker volume (internals only).**

L0 Lowest

L1 Low volume
L2 Medium volume
L3 High volume

M*n* **Operates speaker.**

M0 Speaker always OFF.
M1 Speaker ON until CONNECT.
M2 Speaker always ON.
M3 Speaker ON after dial, until CONNECT.

O*n* **Returns online.**

O0 Returns online.
O1 Returns online and retrains.Q*n*

Q*n* Displays/suppresses result codes.

Q0 Displays result codes.
Q1 Quiet mode; no result codes.
Q2 Displays result codes only in Originate mode.

S*r*.*b*=*n* **Sets bit *.b* of register *r* to *n* (0/OFF or 1/ON).**

S*r*=*n* **Sets register *r* to *n*.**

S*r*? **Displays contents of S-Register *r*.**

S$ **Displays a list of the S-Registers.**

V*n* **Displays verbal/numeric result codes.**

V0 Numeric codes
V1 Verbal codes

X*n* **Sets result code displayed. Default is X4.**

Result Codes	X*n* Setting X0	X1	X2	X3	X4
0/OK	•	•	•	•	•
1/CONNECT	•	•	•	•	•
2/RING	•	•	•	•	•
3/NO CARRIER	•	•	•	•	•
4/ERROR	•	•	•	•	•
5/CONNECT 1200		•	•	•	•
6/NO DIAL TONE			•		•
7/BUSY				•	•
8/NO ANSWER*				•	•
9/Reserved					
10/CONNECT 2400		•	•	•	•
11/RINGING					•
13/CONNECT 9600		•	•	•	•
18/CONNECT 4800		•	•	•	•
20/CONNECT 7200		•	•	•	•
21/CONNECT 12000		•	•	•	•
25/CONNECT 14400		•	•	•	•
43/CONNECT 16800		•	•	•	•
85/CONNECT 19200		•	•	•	•
91/CONNECT 21600		•	•	•	•
99/CONNECT 24000		•	•	•	•
103/CONNECT 26400		•	•	•	•
107/CONNECT 28800		•	•	•	•
151/CONNECT 31200		•	•	•	•
155/CONNECT 33600		•	•	•	•

X*n* Setting

Result Codes (Continued)	X0	X1	X2	X3	X4
256/CONNECT 28000		•	•	•	•
260/CONNECT 29333		•	•	•	•
264/CONNECT 30666		•	•	•	•
268/CONNECT 32000		•	•	•	•
180/CONNECT 33333		•	•	•	•
272/CONNECT 34666		•	•	•	•
276/CONNECT 36000		•	•	•	•
184/CONNECT 37333		•	•	•	•
280/CONNECT 38666		•	•	•	•
284/CONNECT 40000		•	•	•	•
188/CONNECT 41333		•	•	•	•
192/CONNECT 42666		•	•	•	•
196/CONNECT 44000		•	•	•	•
200/CONNECT 45333		•	•	•	•
204/CONNECT 46666		•	•	•	•
208/CONNECT 48000		•	•	•	•
212/CONNECT 49333		•	•	•	•
216/CONNECT 50666		•	•	•	•
220/CONNECT 52000		•	•	•	•
224/CONNECT 53333		•	•	•	•
228/CONNECT 54666		•	•	•	•
232/CONNECT 56000		•	•	•	•
236/CONNECT 57333		•	•	•	•
Adaptive Dialling			•	•	•
Wait for 2nd Dial Tone (W)			•		•
Wait for Answer (@)				•	•
Fast Dial				•	•

*Requires @ in dial string; replaces NO CARRIER

Extended Data Commands

&$ Displays a list of ampersand (&) commands.

&A*n* *E*nables/disables additional result code subsets. See X*n*.

&A0 ARQ result codes disabled
&A1 ARQ result codes enabled
&A2 Modulation indicator added
*&A3 Protocol indicators added ¾ LAPM/MNP/NONE (error control) and V42*bis*/MNP5 (data compression)*

&B*n* Manages modem's serial port rate.

&B0 Variable, follows connection rate
&B1 Fixed serial port rate
&B2 Fixed in ARQ mode, variable in non-ARQ mode

&C*n* Controls Carrier Detect (CD) signal.

&C0 CD override
&C1 Normal CD operations

&D*n* Controls Data Terminal Ready (DTR) operations.

&D0 *DTR override*
&D1 DTR toggle causes online *Command* mode
&D2 Normal DTR operations
&D3 Resets on receipt of DTR

&F*n* Loads a read-only (non-programmable) factory configuration.

&F0 Generic template, no flow control
&F1 Hardware flow control template
&F2 Software flow control template

&G*n* Sets Guard Tone.

&G0 No guard tone, U.S. and Canada
&G1 550 Hz guard tone, some European countries, requires B0 setting.
&G2 1800 Hz guard tone, U.K., requires B0 setting.

&H*n* **Sets Transmit Data (TD) flow control. See also &R*n*.**

&H0 Flow control disabled
&H1 Hardware flow control, Clear to Send (CTS)
&H2 Software flow control, XON/XOFF
&H3 Hardware and software flow control

&I*n* **Sets Receive Data (RD) software flow control. See also &R*n*.**

&I0 Software flow control disabled
&I1 XON/XOFF signals to your modem and remote system
&I2 XON/XOFF signals to your modem only

&K*n* **Enables/disables data compression.**

&K0 Data compression disabled
&K1 Auto enable/disable
&K2 Data compression enabled
&K3 MNP5 compression disabled

&M*n* **Sets Error Control (ARQ) for connections at 1200 bps and higher.**

&M0 Normal mode, error control disabled
&M1 Reserved
&M2 Reserved
&M3 Reserved
&M4 Normal/ARQ
&M5 ARQ mode

&N*n* **Sets connect speed. If connection cannot be established at this speed, the modem will hang up.** When used in conjunction with &U*n* and &U*n* is greater than 0, &N*n* **sets the ceiling connect speed. &U*n* sets the floor connect speed.. See the table in the &U*n* section.**

&N0	*Variable rate*	&N5	7200 bps
&N1	300 bps	&N6	9600 bps
&N2	1200 bps	&N7	12,000 bps
&N3	2400 bps	&N8	14,400 bps
&N4	4800 bps	&N9	16,800 bps

&N10	19,200 bps	&N25	38,666 bps
&N11	21,600 bps	&N26	40,000 bps
&N12	24,000 bps	&N27	41,333 bps
&N13	26,400 bps	&N28	42,666 bps
&N14	28,800 bps	&N29	44,000 bps
&N15	31,200 bps	&N30	45,333 bps
&N16	33,600 bps	&N31	46,666 bps
&N17	28,000 bps	&N32	48,000 bps
&N18	29,333 bps	&N33	49,333 bps
&N19	30,666 bps	&N34	50,666 bps
&N20	32,000 bps	&N35	52,000 bps
&N21	33,333 bps	&N36	53,333 bps
&N22	34,666 bps	&N37	54,666 bps
&N23	36,000 bps	&N38	56,000 bps
&N24	37,333 bps	&N39	57,333 bps

&P*n* **Sets pulse (rotary) dial make/break ratio.**

&P1 U.K. ratio, 33%/67%

&R*n* **Sets Receive Data (RD) hardware flow control, Request to Send (RTS). See also &H*n*.**

&R0 Reserved
&R1 Modem ignores RTS
&R2 *Received Data to computer only on RTS*

&S*n* **Controls Data Set Ready (DSR) operations.**

&S0 *DSR override; always ON*
&S1 Modem controls DSR

&T*n* **Begins test modes.**

&T0 Ends testing
&T1 Analogue Loopback
&T2 Reserved
&T3 Local Digital Loopback
&T4 Enables Remote Digital Loopback
&T5 *Prohibits Remote Digital Loopback*
&T6 Initiates Remote Digital Loopback
&T7 Remote Digital with self-test and error detector
&T8 Analogue Loopback with self-test and error detector

&U*n* **Sets floor connect speed when &U*n* is set above 0. If the connection cannot be established above this speed, the modem will hang up. When &U*n* is used in conjunction with &N*n* and &N*n* is greater than 0, &N*n* is the ceiling connect speed.**.

	&N=0	**&N>0**
&U=0	Connects at best possible speed	Connects at speed defined by &N*n*. If connection cannot be established at this speed, the modem will hang up. with the remote modem.

Note: The factory default settings of &N and &U should be sufficient for most users.

&U>0 Connects at fastest speed possible above the value of &U*n.* Connects at fastest speed possible between &N*n*. and &U*n*

&U0	*No restrictions on the minimum speed of the connection*		
&U1	300 bps	&U21	33,333 bps
&U2	1200 bps	&U22	34666 bps
&U3	2400 bps	&U23	36000 bps
&U4	4800 bps	&U24	37,333 bps
&U5	7200 bps	&U25	38666 bps
&U6	9600 bps	&U26	40000 bps
&U7	12,000 bps	&U27	41,333 bps
&U8	14,400 bps	&U28	42,666 bps
&U9	16,800 bps	&U29	44,000 bps
&U10	19,200 bps	&U30	45,333 bps
&U11	21,600 bps	&U31	46666 bps
&U12	24,000 bps	&U32	48000 bps
&U13	26,400 bps	&U33	49333 bps
&U14	28,800 bps	&U34	50666 bps
&U15	31,200 bps	&U35	52000 bps
&U16	33,600 bps	&U36	53333 bps
&U17	28000 bps	&U37	54666 bps
&U18	29333 bps	&U38	56000 bps
&U19	30666 bps	&U39	57333 bps
&U20	32000 bps		

&W*n* **Writes current configuration to NVRAM templates.**

&W0 Modifies the NVRAM 0 template (Y0)
&W1 Modifies the NVRAM 1 template (Y1)

&Y*n* **Sets break handling.**

&Y0 Destructive, but doesn't send break
&Y1 Destructive, expedited
&Y2 Nondestructive, expedited
&Y3 Nondestructive, unexpedited

&Z*n*=*s* Writes phone number string *s* NVRAM at position *n (n* = 0–3).

&Z*n*=L Writes last executed dial string to NVRAM at position n (n = 0–3).

&Z*n*? Displays the phone number stored at position n (n = 0–3).

&ZL? Displays the last executed dial string.

+++ Escapes to online-command mode.

+++ Escapes to online-command mode.

S-Registers

To change a setting, use the ATS*r*=*n* command, where *r* is the register and *n* is a decimal value from 0 – 255 (unless otherwise indicated).

Register	Default	Function
S0	0	Sets the number of rings on which to answer in Auto Answer Mode. When set to 0, Auto Answer is disabled.
S1	0	Counts and stores the number of rings from an incoming call. (S0 must be greater than 0.)
S2	43	Stores the ASCII decimal code for the escape code character. Default character is +. A value of 128 – 255 disables the escape code.
S3	13	Stores the ASCII code for the Carriage Return character. Valid range is 0 – 127.
S4	10	Stores the ASCII decimal code for the Line Feed character. Valid range is 0 – 127.
S5	8	Stores the ASCII decimal code for the Backspace character. A value of 128–255 disables the Backspace key's delete function.
S6	2	Sets the number of seconds the modem waits before dialling. If X*n* is set to X2 or X4, this is the time-out length if there isn't a dial tone.
S7	60	Sets the number of seconds the modem waits for a carrier. May be set for much longer duration if, for example, the modem is originating an international connection.

Register	Default	Function
S8	2	Sets the duration, in seconds, for the pause (,) option in the Dial command.
S9	6	Sets the required duration, in tenths of a second, of the remote modem's carrier signal before recognition by the modem.
S10	7	Sets the duration, in tenths of a second, that the modem waits to hang up after loss of carrier. This guard time allows the modem to distinguish between a line disturbance from a true disconnect (hang up) by the remote modem.
	.	**NOTE:** If you set S10 = 255, the modem will not hang up when carrier is lost. Dropping DTR hangs up the modem.
S11	70	Sets the duration and spacing, in milliseconds, for tone dialling.
S12	50	Sets the duration, in fiftieths of a second, of the guard time for the escape code sequence (+++).

Register	Default	Function
S13	0	Bit-mapped register. Select the bit(s) you want on and set S13 to the total of the values in theValue column. For example, ATS13 = 17 enables bit 0 (value is 1) and bit 4 (value is 16).

Bit	Value	Result
0	1	Reset when DTR drops.
1	2	Reset non-MNP transmit buffer from 1.5K to 128 bytes.*
2	4	Set backspace key to delete.
3	8	On DTR signal, auto dial the number stored in NVRAM at position 0.
4	16	At power on/reset, Auto Dial the number stored in NVRAM at position 0.
5	32	Reserved
6	64	Disable quick retrains.
7	128	Disconnect on escape code.

* The 1.5K-byte non-ARQ buffer allows data transfer with Xmodem- and Ymodem-type file transfer protocols without using flow control.
The 128-byte option lets remote users with slower modems keep data you're sending from scrolling off their screens. When remote users send your computer an XOFF (Ctrl-S) and you stop transmitting, the data in transit from your modem's buffer doesn't exceed the size of their screen. This is also very helpful in situations when a remote modem/printer application is losing characters.

Register	Default	Function
S14	0	Reserved
S15	0	Bit-mapped register setup. To set the register, see instructions for S13.

Bit	Value	Result
0	1	Disable ARQ/MNP for V.22.
1	2	Disable ARQ/MNP for V.22bis.
2	4	Disable ARQ/MNP V.32/V.32bis/V.32terbo.
3	8	Disable MNP handshake.
4	16	Disable MNP level 4.
5	32	Disable MNP level 3.
6	64	MNP incompatibility.
7	128	Disable V.42 operation.

To disable V.42 detect phase, select the total of the values for bits 3 and 7 (in other words S15+136 [the sum of values 8 and 128])

S16	0	Reserved
S17	0	Reserved
S18	0	Test timer for &T loopback testing. Sets the time in seconds of testing before the modem automatically times out and terminates the test. When set to 0, the timer is disabled. Valid range is 1-255.
S19	0	Sets the duration, in minutes, for the inactivity timer. The timer activates when there is no data activity on the phone line; at time-out the modem hangs up. S19 = 0 disables the timer.
S20	0	Reserved

Register	Default	Function
S21	10	Sets the length, in 10-millisecond units, of breaks sent from the modem to the computer; applies to MNP or V.42 mode only.
S22	17	Stores the ASCII decimal code for the XON character.
S23	19	Stores the ASCII decimal code for the XOFF character.
S24	0	Reserved
S25	20	Sets the duration, in hundredths of a second, that DTR must be dropped so that the modem doesn't interpret a random glitch as a DTR loss. (Most users will want to use the default; this register is useful for setting compatibility with older systems running under older operating software.)
S26	0	Reserved
S27	0	Bit-mapped register setup. To set the register, see instructions for S13.

Bit	Value	Result
0	1	Enables ITU-T V.21 modulation at 300 bps. 1 2 Enables unencoded (non-trellis coded) modulation in V.32 mode.
2	4	Disables V.32 modulation.
3	8	Disables 2100 Hz answer tone to allow two V.42 modems to connect faster.
4	16	Enables V.23 modulation.
5	32	Disables V.32*bis* mode.
6	64	Disable V.42 selective reject.

Register	Default	Function
		7 128 Software compatibility mode. This setting disables the codes and displays the 9600 code instead. The actual rate of the call can be viewed on the ATI6 screen Used for unusual software incompatibilities. Some software may not accept 7200, 12,000, and 14,400 bps or greater result codes.
S28	0	Eliminates the V.32 answer tones for a faster connection.
	8	Default item, all times are in tenths of seconds.
	255	Disables all connections except V.32 at 9600 bps.
S29	20	Sets the duration, in tenths of a second, of the V.21 answer mode fallback timer.
S30	0	Reserved
S31	128	Reserved
S32	2	Bit mapped register setup. To set the register, see the instructions for S13.

Bit	Value	Result
0	1	V.8 Call Indicate enabled.
1	2	Enables V.8 mode.
2	4	Reserved.
3	8	Disable V.34 modulation.
4	16	Disable V.34+ modulation.
5	32	Disable x2 modulation.
6	64	Disable V.90 modulation.
7	128	Reserved.

Register	Default	Function
S33	0	Bit mapped register setup. To set the register, see the instructions for S13.

Bit	Value	Result
0	1	Disable 2400 symbol rate.
1	2	Disable 2743 symbol rate.
2	4	Disable 2800 symbol rate.
3	8	Disable 3000 symbol rate.
4	16	Disable 3200 symbol rate.
5	32	Disable 3429 symbol rate.
6	64	Reserved
7	128	Disable shaping.

S34 0 Bit mapped register setup. To set registers, see instructions for S13.

Bit	Value	Result
0	1	Disable 8S-2D trellis encoding.
1	2	Disable 16S-4D trellis encoding.
2	4	Disable 32S-2D trellis encoding.
3	8	Disable 64S-4D trellis encoding.
4	16	Disable non-linear coding.
5	32	Disable TX level deviation.
6	64	Disable Pre-emphasis.
7	128	Disable Pre-coding.

S35-S37 Reserved

Register	Default	Function
S38	0	Sets an optional delay, in seconds, before a forced hang-up and clearing of the Transmit buffer when DTR drops during an ARQ call. This allows time for a remote modem to acknowledge receipt of all transmitted data before it is disconnected. The modem immediately hangs up when DTR drops. This option only applies to connections terminated by dropping DTR. If the modem receives the ATH command, it ignores S38 and immediately hangs up.
S39-S40	0	Reserved
S41	0	Reserved
S42	0	Reserved
S43	112	Autonomous 8-bit S-Register. Bit mapped register stored in NVRAM.

Bit	Value	Result
0	1	56K Message Modem disabled.
1	2	Dialup Retrieval disabled.
2	4	N/A
3	8	Monitor disable.
4	16	Fax Reception and Storage enabled.
5	32	Voice Reception and Storage enabled.
6	64	(High) Answer in SR Mode after four RINGs.
7	128	(Low) Answer in SR Mode after four RINGs.

Fax Commands

FCLASS=*n* **Sets the mode of operation**

FCLASS=0	*Data mode*
FCLASS=1	Group 3 Facsimile Service Class 1 mode
FCLASS=2.0	Group 3 Facsimile Service Class 2.0 mode

FCLASS? Displays the current FCLASS mode (See mode descriptions above)

+FCLASS=? Displays the FCLASS mode options (See mode descriptions above)

+FTS=*n* Stops the fax transmission. Then the modem waits for a specified time before **OK** appears on screen. The pause is set in 10 millisecond intervals. *n* is the number of 10 millisecond intervals that pass before **OK** appears. (*n*=0-255)

+FRS=*n* Makes the modem wait for a specified length of silence before sending **OK** to the screen. The pause is set in10 millisecond intervals. *n* is the number of 10 millisecondintervals that pass before **OK** appears.(*n*=0-255) Note: This command terminates with **OK** when either the specified amount of silence is detected or when the user types anything (which is ignored).

+FTM=*n* Transmits data using the modulation specified by *n*.(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146) Note: See the “Screen Messages” table at the end of this section for an explanation of messages that appear in response to this command.

+FRM=*n* Receives data using the modulation specified by *n*.(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146) Note: See the “Screen Messages” table at the end of this section for an explanation of messages that appear in response to this command.

+FTH=*n* Transmits data framed in the HDLC protocol using the modulation specified by *n*. (*n* = 3, 24, 48, 72, 96, 97, 98, 121,122, 145, or 146)
Note: See the “Screen Messages” table at the end of this section for an explanation of messages that appear in response to this command.

+FRH=*n* Receives data framed in the HDLC protocol using the modulation specified by *n*. (*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146)
Note: See the “Screen Messages” table at the end of this section for an explanation of messages that appear in response to this command.

Screen Messages

Displayed as a number	Displayed in words	Description
0	OK	The previous command has been processed successfully.
1	CONNECT	The modem has just connected to another modem.
2	RING	Reports the receipt of a network altering ring.
3	NO CARRIER	No carrier is being received from the modem.
4	ERROR	The previous command line has not been recognized or was completed abnormally.
5	NO DIAL TONE	(Optional) Dial tone was not received within the time-out period.
6	BUSY	(Optional) A busy signal was deleted.
64	CONNECT/FAX	(Optional) The modem has established a fax connection. This response is used only when the fax mode is selected.

The Serial Interface

The serial interface is a standard developed by the Electronic Industries Association (EIA). It defines the signals and voltages used when data is exchanged between a computer and a modem or serial printer.

The entire standard covers many more functions than are used in most data communications applications. Data is transmitted between the devices over a shielded serial cable with a 25-pin male (DB-25P) connector to the modem and a 25-pin, 9-pin, 8-pin, or custom-built connector to the computer.

Pin assignments are factory-set in the 56K Message Modem to match the standard DB-25 assignments in the following table. DB-9 connectors for IBM/AT-compatible computers should be wired at the computer end of the cable as shown in the DB-9 column.

Serial Interface Pin Definitions

DB-25	DB-9	Circuit	Function	Signal Source Computer/Modem
1	—	AA	Chassis Ground	Both
2	3	BA	Transmitted Data	Computer
3	2	BB	Received Data	Modem
4	7	CA	Request to Send	Computer
5	8	CB	Clear to Send	Modem
6	6	CC	Data Set Ready	Modem
7	5	AB	Signal Ground	Both
8	1	CF	Carrier Detect	Modem
12	—	SCF	Speed Indicate	Modem
20	4	CD	Data Terminal Ready	Computer
22	9	CE	Ring Indicate	Modem

Section E : CE Compliance

Electromagnetic Compatibility

This device complies with the following standards in accordance with European Directives 89/336/EEC:

- Immunity EN 50082-1 06/92
- Emission EN 55022 class B 08/87

Safety (Low Voltage Directive)

This device complies with the following standards in accordance with European Directive 91/263/EEC and 91/263/EEC:

- EN 60950/A2 10/93
- EN 41003 08/93

The ports on this modem have the following safety status:

- Telephone line connector = TNV
- All other ports = SELV

These definitions are classified as per safety standard:

EN 60950/A2 10/93.

- SELV: Safety Extra Low Voltage
- TNV: Telecommunications Network Voltage, voltages in compliance with standard EN 41003 08/93 criteria.

CTR 21 Approval (in the UK and Ireland only)

This equipment has been approved in accordance with Council Decision 98/482/EC for pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

In the event of problems, you should contact your equipment supplier in the first instance.

Network Compatibility Declaration

This equipment is designed to work satisfactorily on all European Union PSTN networks.

This equipment is supplied with a suitable PSTN connector for the country in which it was supplied. If it is required to use this equipment on a different network to the one for which it was supplied, the user is advised to contact the vendor for guidance regarding connection.

Section F : Limited Warranty

3Com UK Limited warrants to the original consumer or other end user that this product is free from defects in materials or workmanship for the lifetime of the product. Upon proof of purchase, the product will be repaired or replaced (with the same or similar model) at our option, without charge for either parts or labour. This warranty shall not apply if the product is modified, tampered with, misused or subjected to abnormal working conditions.

REPAIR AND REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE AND 3COM U.S. ROBOTICS SHALL IN NO EVENT BE LIABLE TO THE PURCHASER FOR THE INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER.

If you would like further information or the name of your nearest 3Com dealer, call SALES on,

FREEPHONE **0 8 0 0 2 2 5 2 5 2**

or look at,

http://www.3com.co.uk

NOTE - For Technical Support, refer to the *Contact 3Com Technical Support* section.

All U.S. Robotics brand modems are BABT approved and CE marked, and are supplied with free lifetime technical support.